AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of forming a coplanar waveguide comprising the acts of:

depositing an insulating material on a substrate;

forming a signal conductor line over ~~a substrate~~ said insulating material;

forming two longitudinal ground conductor planes over said substrate and on opposing sides of said signal conductor line, said ground conductor planes being spaced from said signal conductor line, wherein the acts of forming said signal conductor line and at least one of said ground conductor planes further comprise depositing a conductive material on top of said insulating layer; and

subsequently forming a trench in said substrate in an area between at least one of said ground conductor planes and said signal conductor line.

Claim 2. (Canceled)

3. (Currently Amended) The method of claim ~~2~~ 1, wherein said insulating layer is an oxide layer.

4. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

depositing an oxide layer on said substrate;

depositing a barrier layer on said oxide layer;

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line, wherein the acts of forming said signal conductor line and said ground conductor plane comprise depositing a conductive material on top of said barrier layer; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

5. (Original) The method of claim 4, wherein said conductive material is a metal layer, said method further comprising forming a silicide layer on sidewalls of said metal layer.

6. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line;

depositing an oxide layer on said substrate to a thickness of about 200 Angstroms to about 300 Angstroms, wherein the acts of forming said signal conductor line and said ground conductor plane comprise depositing a conductive material on top of said oxide layer; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

7. (Original) The method of claim 4, wherein said barrier layer is deposited to a thickness of about 50 Angstroms to about 100 Angstroms.

8. (Original) The method of claim 4, wherein said barrier layer comprises TiN.

9. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

depositing an insulating layer on said substrate;

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line, wherein the acts of forming said signal conductor line and said ground conductor_plane comprise depositing a conductive material on top of said insulating layer to a thickness of about 100,000 Angstroms to about 200,000 Angstroms; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

10. (Currently Amended) The method of claim ~~2~~ 1, wherein said conductive material comprises copper.

11. (Currently Amended) The method of claim ~~2~~ 1, wherein said conductive material is deposited by thermal evaporation.

12. (Original) The method of claim 5, wherein said metal layer is exposed to silane to form said silicide layer.

13. (Previously presented) The method of claim 12, wherein said metal layer is exposed to silane at about 300^{0}C to form said silicide layer.

14. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line; and

subsequently etching a trench to a depth of about 100,000 Angstroms to about 200,000 Angstroms in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

15. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line; and

subsequently etching a trench at a rate of about 2.2 μm/min in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

16. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line by about 150,000 Angstroms to about 200,000 Angstroms; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

17. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a substrate, wherein said signal conductor line has a width of about 250,000 Angstroms to about 350,000 Angstroms;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

18. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line, wherein said ground conductor planes and signal conductor line have a thickness of about 100,000 Angstroms to about 200,000 Angstroms; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.

19. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a silicon substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line; and

subsequently forming at least one trench in said silicon substrate in an area between said at least one ground conductor plane and said signal conductor line, said at least one trench having a depth of about 100,000 Angstroms to about 200,000 Angstroms and a width of about 100,000 Angstroms to about 150,000 Angstroms.

20. (Previously Presented) The method of claim 19, further comprising depositing an oxide layer on said silicon substrate, wherein the acts of forming said

signal conductor line and said ground conductor plane further comprise depositing a copper layer on top of said oxide layer.

21. (Original) The method of claim 20 further comprising depositing a barrier layer on said oxide layer before depositing said copper layer.

22. (Original) The method of claim 20 further comprising forming a silicide layer on sidewalls of said copper layer.

23. (Original) The method of claim 20, wherein said oxide layer is deposited to a thickness of about 200 Angstroms to about 300 Angstroms.

24. (Original) The method of claim 21, wherein said barrier layer is deposited to a thickness of about 50 Angstroms to about 100 Angstroms.

25. (Original) The method of claim 21, wherein said barrier layer comprises TiN.

26. (Original) The method of claim 20, wherein said copper layer is deposited to a thickness of about 100,000 Angstroms to about 200,000 Angstroms.

27. (Original) The method of claim 22, wherein said copper layer is exposed to silane to form said silicide layer.

28. (Previously Presented) The method of claim 27, wherein said copper layer is exposed to silane at about 300^{0}C to form said silicide layer.

29. (Original) The method of claim 19, wherein said ground conductor plane is spaced from said signal conductor line by about 150,000 Angstroms to about 200,000 Angstroms.

30. (Original) The method of claim 19, wherein said signal conductor line has a width of about 250,000 Angstroms to about 350,000 Angstroms.

31. (Original) The method of claim 19, wherein said ground conductor planes and signal conductor line has a thickness of about 100,000 Angstroms to about 200,000 Angstroms.

32. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming a signal conductor line over a silicon substrate;

forming at least one longitudinal ground conductor plane over said substrate and on a side of said signal conductor line, said ground conductor plane being spaced from said signal conductor line; and

forming at least one trench in said silicon substrate by use of an isotropic etching process in an area between said at least one ground conductor plane and said signal conductor line, said at least one trench having a radius of about 50,000 Angstroms to about 100,000 Angstroms.

33. (Previously Presented) The method of claim 32, further comprising depositing an oxide layer on said silicon substrate, wherein the acts of forming said signal conductor line and said ground conductor plane further comprise depositing a copper layer on top of said oxide layer.

34. (Original) The method of claim 33 further comprising depositing a barrier layer on said oxide layer before depositing said copper layer.

35. (Original) The method of claim 34 further comprising forming a silicide layer on sidewalls of said copper layer.

36. (Original) The method of claim 33, wherein said oxide layer is deposited to a thickness of about 200 Angstroms to about 300 Angstroms.

37. (Original) The method of claim 34, wherein said barrier layer is deposited to a thickness of about 50 Angstroms to about 100 Angstroms.

38. (Original) The method of claim 34, wherein said barrier layer comprises TiN.

39. (Original) The method of claim 33, wherein said copper layer is deposited to a thickness of about 100,000 Angstroms to about 200,000 Angstroms.

40. (Original) The method of claim 35, wherein said copper layer is exposed to silane to form said silicide layer.

41. (Previously presented) The method of claim 40, wherein said copper layer is exposed to silane at about 300° C to form said silicide layer.

42. (Original) The method of claim 32, wherein said ground conductor plane is spaced from said signal conductor line by about 150,000 Angstroms to about 200,000 Angstroms.

43. (Original) The method of claim 32, wherein said signal conductor line has a width of about 250,000 Angstroms to about 350,000 Angstroms.

44. (Original) The method of claim 32, wherein said ground conductor planes and signal conductor line has a thickness of about 100,000 Angstroms to about 200,000 Angstroms.

Claims 45-91. (Canceled)

92. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming an insulating layer over a silicon substrate;

forming a photoresist layer over said insulating layer;

patterning said photoresist layer to provide a plurality of openings, said openings being spaced apart and exposing said insulating layer;

forming a barrier layer at a bottom of said openings in said photoresist layer over any exposed portions of said insulating layer;

partially filling said openings with a conductive material to form a conductive layer;

forming a silicon insulating layer over said conductive layer to completely fill said openings;

removing remaining portions of said photoresist;

forming a passivation layer on exposed sidewalls of said conductive layer; and

forming a plurality of trenches in said silicon substrate and between said openings.

93. (Previously Presented) The method of claim 92, wherein said insulating layer is an oxide layer.

94. (Previously Presented) The method of claim 92, wherein said openings have a width of 250,000 Angstroms to about 350,000 Angstroms.

95. (Previously Presented) The method of claim 92, wherein said barrier layer comprises a bonding material selected from the group consisting of tantalum, titanium, titanium-tungsten, titanium nitride and chromium.

96. (Previously Presented) The method of claim 92, wherein said conductive layer comprises copper.

97. (Previously Presented) The method of claim 92, wherein said conductive layer is formed to a thickness of about 100,000 Angstroms to about 200,000 Angstroms.

98. (Previously Presented) The method of claim 92, wherein said silicon oxide layer is deposited by thermal evaporation at or near room temperature.

99. (Previously Presented) The method of claim 99, wherein said silicon oxide layer is formed to a thickness of about 5,000 Angstroms to about 10,000 Angstroms.

100. (Previously Presented) The method of claim 92, wherein said passivation layer is formed to a thickness of about 50 Angstroms to about 100 Angstroms.

101. (Previously Presented) The method of claim 92, wherein said passivation layer is a silicide layer.

102. (Previously Presented) The method of claim 92, wherein said trenches have a depth of about 100,000 Angstroms to about 200,000 Angstroms and a width of about 150,000 Angstroms.

103. (Previously Presented) The method of claim 92, wherein said trenches are formed by reactive ion etching using a deep trench etcher at an etch rate of about 2.2 μm/min.

104. (Previously Presented) The method of claim 92, wherein said trenches are formed by an isotropic etching process

105. (Previously Presented) The method of claim 92, wherein said trenches have a circular shape with a radius of about 50,000 Angstroms to about 100,000 Angstroms.

106. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

depositing an oxide layer over a silicon substrate;

forming a photoresist layer over said oxide layer;

patterning said photoresist layer to provide a plurality of openings, said openings being spaced apart by about 150,000 Angstroms to about 200,000 Angstroms and exposing said oxide layer;

depositing a barrier layer at a bottom of said openings over any exposed portions of said oxide layer, wherein said barrier layer comprises a bonding material selected from the group consisting of tantalum, titanium, titanium-tungsten, titantium nitride and chromium;

depositing a copper layer by thermal evaporation in said partially filled openings to partially fill said openings;

forming a silicon oxide layer over said partially filled openings to completely fill said openings;

removing remaining portions of said photoresist to form a signal copper line;

forming a passivation layer on exposed sidewalls of said signal copper line; and

etching said silicon substrate between said openings and to a depth of about 100,000 Angstroms to about 200,000 Angstroms to form a plurality of trenches.

107. (Previously Presented) The method of claim 106, wherein said copper layer has a thickness of about 100,000 Angstroms to about 200,000 Angstroms.

108. (Previously Presented) The method of claim 106, wherein said copper layer is exposed to silane to form a silicide layer on sidewalls of said copper layer.

109. (Previously Presented) The method of claim 108, wherein said copper layer is exposed to silane at 300° C to form said silicide layer.

110. (Previously Presented) A method of forming a coplanar waveguide comprising the acts of:

forming an insulating layer over a silicon substrate;

forming a photoresist layer over said insulating layer;

patterning said photoresist layer to provide a plurality of openings, said openings being spaced apart and exposing said insulating layer;

forming a barrier layer at a bottom of said openings in said photoresist layer over any exposed portions of said insulating layer;

forming a signal conductor line over said substrate;

forming at least one longitudinal ground conductor plane over said substrate and on opposing sides of said signal conductor line, wherein the acts of forming said signal conductor line and said at least one ground plane comprise partially filling said openings with a conductive material to form a conductive layer;

forming a silicon insulating layer over said conductive layer to completely fill said openings;

removing remaining portions of said photoresist;

forming a passivation layer on exposed sidewalls of said conductive layer; and

subsequently forming a trench in said substrate in an area between said at least one ground conductor plane and said signal conductor line.